

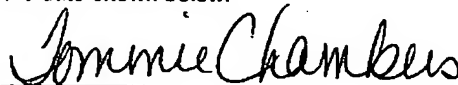
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NAME OF INVENTOR(S): Koe		RECEIPT DATE & SERIAL NO.:  Serial No.: 10/766,233 Patent No.: 6,940,438 Filing Date: 1/28/2004
TITLE OF INVENTION:  METHOD AND CIRCUIT FOR REDUCING QUANTIZER INPUT/OUTPUT SWING IN A SIGMA-DELTA MODULATOR		
TI FILE NO.:  TI-36585	DEPOSIT ACCT. NO.:  20-0668	
FAXED: 09/09/2005 DUE: ATTY/SECY: WDS/tc		

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Applicant: Koe, et al.  
Serial No.: 10/766,233  
Filing Date: 1/28/2004  
Patent No.: 6,940,438

Art Unit: 2819  
Examiner: Mai, Lam T.  
Docket No.: TI-36585  
Issue Date: 9/6/2005

Title: METHOD AND CIRCUIT FOR REDUCING QUANTIZER INPUT/OUTPUT SWING IN A  
SIGMA-DELTA MODULATOR

LETTER OF TRANSMITTAL

Assistant Commissioner for  
Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Sir:

<p>CERTIFICATION OF FACSIMILE TRANSMISSION</p> <p>I hereby certify that the following papers are being transmitted by facsimile to the U.S. Patent and Trademark Office at 571-273-8300 on <u>9-9-05</u>:</p> <p><i>Tommie Chambers</i> Tommie Chambers</p>
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Enclosed is a Certificate of Correction for U.S. Patent No. 6,578,123.

Applicants believe that the error is the responsibility of the United States Patent and Trademark Office, therefore do fees are due at this time.

Respectfully submitted,

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO: 6,940,438

DATED: 09/06/2005

INVENTOR(S): Wern Ming Koe, Franco Maloberti, and James Robert Hochschild

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

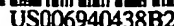
Inventors: Wern Ming Koe, Dallas, TX (US)  
Franco Maloberti, Plano, TX (US)  
James Robert Hochschild, Plano, TX (US)

MAILING ADDRESS OF SENDER: W. Daniel Swayze, Jr.  
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PATENT NO. 6,940,438

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(10) Patent No.: US 6,940,438 B2  
(45) Date of Patent: Sep. 6, 2005

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\* cited by examiner

**Primary Examiner—Lam T. Mai**

(74) Attorney, Agent, or Firm—W. Daniel Swayze, Jr.; W. James Brady; Frederick J. Telecky, Jr.

(57) ABSTRACT

Disclosed is a circuit and method for reducing output swing in a sigma delta modulator. The quantizer output swing reduction circuit and method of the present invention advantageously enables the modulator to have a larger input/output swing range without degrading the SNR and SFDR performance. One embodiment of the present invention comprises a conventional sigma-delta modulation circuit (100) and a quantizer swing reduction block (210). The quantizer swing reduction block (210) comprises an input signal  $V_x$  (216), a signal processing block (214) with transfer function  $H_3$  and another signal processing block (215) with transfer function  $H_2 \cdot H_3$ .

(57) ABSTRACT

Disclosed is a circuit and method for reducing output swing in a sigma delta modulator. The quantizer output swing reduction circuit and method of the present invention advantageously enables the modulator to have a larger input/output swing range without degrading the SNR and SFDR performance. One embodiment of the present invention comprises a conventional sigma-delta modulation circuit (100) and a quantizer swing reduction block (210). The quantizer swing reduction block (210) comprises an input signal  $V_x$  (216), a signal processing block (214) with transfer function  $H_3$  and another signal processing block (215) with transfer function  $H_2 \cdot H_3$ .

(57) ABSTRACT

Disclosed is a circuit and method for reducing output swing in a sigma delta modulator. The quantizer output swing reduction circuit and method of the present invention advantageously enables the modulator to have a larger input/output swing range without degrading the SNR and SFDR performance. One embodiment of the present invention comprises a conventional sigma-delta modulation circuit (100) and a quantizer swing reduction block (210). The quantizer swing reduction block (210) comprises an input signal  $V_x$  (216), a signal processing block (214) with transfer function  $H_3$  and another signal processing block (215) with transfer function  $H_2 \cdot H_3$ .

(57) ABSTRACT

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